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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF APPROVING A NON-RADIOACTIVE AIR EMISSIONS NOTICE OF CONSTRUCTION APPLICATION FOR INSTALLATION AND OPERATION OF WASTE RETRIEVAL SYSTEMS IN SINGLE-SHELL TANKS 241-U-107, 241-S-102, 241-S-112 FOR THE DEPARTMENT OF ENERGY-RICHLAND	)	NOC APPROVAL ORDER **NUMBER: DE03NWP-001R1**

To: Mr. James E. Rasmussen, Director
U. S. Department of Energy
Office of River Protection
Environmental Management Division
P.O. Box 450, MSIN: H6-60
Richland, Washington 99352

FINDINGS

On February 4, 2003, the United States Department of Energy, Office of River Protection (USDOE-ORP), submitted a Notice of Construction (NOC) application for installation and operation of a waste retrieval system in single-shell tanks 241-U-107, 241-S-102, and 241-S-112, located on the Hanford Site 200 Area.

On March 12, 2003, the Washington State Department of Ecology (Ecology) approved the submitted NOC with issuance of NOC Approval Order number DE03NWP-001 including approval condition 2.C that "Any or all of this approval order may be modified, upon Ecology concurrence or discretion, depending upon circumstances and findings during conduct of the operations herein described."

Following issuance of NOC Approval Order number DE03NWP-001, the proposed project has substantially completed retrieving the waste from tank 241-S-112 and there have been advances in the sampling, analysis, knowledge, and estimates of tank waste constituents and project air contaminant emissions.

It is recognized that emission results to be developed during this project may substantially support Best Available Control Technology (BACT) and Best Available Control Technology for Toxics (T-BACT) determinations and demonstrate compliance with Toxic Air Pollution (TAP) emission standards for future operations of tank waste retrievals by the USDOE-ORP.

In relation to the above, Ecology, pursuant to the Revised Code of Washington (RCW) 70.94.152, Washington Administrative Code (WAC) Chapters 173-400, and 173-460, makes the following determinations as revised herein:

The proposed project, if constructed and operated as herein required, will be in accordance with applicable rules and regulations, as set forth in WAC Chapters 173-400 and 173-460, and the operation thereof, at the locations proposed, will not result in ambient air quality standards being exceeded.

The proposed project, if constructed and operated as herein required, will provide all known, available, and reasonable methods of emission control.

1. LAWS AND REGULATIONS

All proposed activities performed in support of installation and operation of a waste retrieval system in Single Shell Tanks by the USDOE-ORP, referred to herein as the Permittee, shall comply with all requirements as specified in:

- RCW Chapter 70.94, *Washington Clean Air Act*,
- WAC Chapter 173-400, *General Regulations for Air Pollution Sources*,
- WAC Chapter 173-460, *Controls for New Sources of Toxic Air Pollutants.*

2. EMISSIONS

Based on the headspace characterization data and typical waste tank passive ventilation rates, emissions of regulated vapors from tanks 241-S-102, 241-S-112, and 241-U-107 are currently very low. Waste fill histories indicate no wastes with high organic content have been stored in these tanks, but Ecology is not aware that fill histories documented many individual toxic organic contaminants. However, evolving characterization data does tend to highlight greater than previously anticipated organic material inventories within tank 241-S-102. In addition, chemical reactions within the tanks generate new organic compounds from other substances added to the tanks. Ecology is aware of very few records documenting what types of wastes were added to the tanks in trace amounts, and/or on a non-routine basis. The nature of TAP emissions from the waste is complex, and needs to be better understood to support future retrieval operations.

No new TAPs are expected to be emitted during this process. One TAP, N-nitrosodimethylamine, does not have an established Small Quantity Emission Rate (SQER) because it is a Class A TAP with an acceptable source impact level (ASIL) below the allowable level for a SQER as specified in WAC 173-460-080(e). A simplified dispersion calculation was performed to estimate the annual average concentration of this compound at the Hanford Site boundary. This calculation indicated the average site boundary concentration of N-nitrosodimethylamine to be about 5.5×10^{-7} $\mu g/m^3$ for

241-S-102, 5.0 x 10^{-7} $\mu g/m^3$ for 241-S-112, and 1.1 x 10^{-6} $\mu g/m^3$ for 241-U-107. Compared to the WAC 173-460-150 ASIL value of 7.1 x 10^{-5} $\mu g/m^3$, the impact of this constituent on emissions, from this source alone, is acceptable at the boundary of the Hanford Site.

Of the TAPs evaluated, ammonia had the highest value, and it was only 2.3 percent of the SQER value listed in WAC 173-460. Dispersion calculations of annual concentrations of TAPS without SQERs indicate average site boundary concentrations of these compounds are expected to be below ASILs.

No significant fraction of the emissions from the exhauster will be assumed to be in particulate form following the High Efficiency Particulate Air (HEPA) filtration installed on the exhauster. The operation of the HEPA filtration system is regulated and permitted by the Washington State Department of Health.

3. BACT

WAC 173-400-113 requires the use of Best Available Control Technology (BACT) to control emissions. Since emissions will be below the threshold levels contained in WAC 173-400-110(5)(d), no technology controls are warranted.

4. T-BACT

WAC 173-460-040(4)(b) requires the use of Best Available Control Technology for Toxics (T-BACT) to control toxic emissions. There are no threshold levels for toxic air emissions. A T-BACT analysis has not been required by Ecology in the past for similar work. In lieu of T-BACT demonstration, the following controls will be implemented:

- Use of active ventilation and de-entrainment (mist elimination system). Periodic wash down of the de-entrainment pad will be considered as a means to minimize emissions if necessary.

Or

- Implementation of an effective Industrial Hygiene Plan as part of an overall Health and Safety program, and establishment of controls and limits therein for the purpose of minimizing emissions. The IH Plan must include a site-specific plan and all related policies, procedures, and general plans necessary to implement the site-specific plan.

ADDITIONAL FINDINGS

The proposed project is a modification to three existing tanks, 241-U-107, 241-S-102 and 241-S-112. The objective of the Retrieval Project is to use water in a controlled fashion to dissolve and/or mobilize waste in the tanks for retrieval by pumping to the DST system. The modification will include the following activities:

- Removal/Installation of various tank equipment and instrumentation,

- Possible installation of a hose-in-hose transfer line (HIHTL),
- Installation/Operation of a portable exhauster,
- Operation of the water distribution system and waste transfer pump

1. PROCESS DESCRIPTION

A water distribution system installed in each tank will introduce water to dissolve the soluble waste and mobilize the insoluble waste. A water distribution skid will be positioned near to or on top of each tank with one inlet line connection from the raw water line in each associated tank farm. The raw water line will provide water at approximately 70 lb/in^2 and adequate flow rates to the water distribution skid under normal operating conditions. Total flow from the skid will be approximately 80 to 100 gallons per minute (gpm) if a 2-inch line is used or 100 to 220 gpm if a 3-inch line is used. The water will be distributed through spray nozzle devices located in various risers. These devices are planned to operate at a flow rate of 35 to 80 gpm each. The water passes through a flow meter/totalizer before supplying each of the water distribution spray nozzle devices.

The resulting dissolved/mobilized waste solution will be pumped to the 241-SY tank farm via in-place transfer lines, a hose in hose transfer line (HIHTL), or bermed pipe-in-pipe transfer lines. Flexible jumpers and manifolds in the associated pit structures provide the necessary connections between the various transfer line segments.

2. VENTILATION AND EMISSIONS CONTROL SYSTEM

A portable exhauster may be connected to the headspace of each tank being retrieved and may be operated as needed to provide improved visibility during salt cake dissolution and waste transfer. The exhauster may also be used to minimize fugitive emissions resulting from construction and operation of the retrieval system. The exhauster consists of a de-entrainer (i.e. mist eliminator), heater, pre-filter, two (2) stages of HEPA filters, an exhaust fan (rated at either 250 or 500 cfm) and the 17 foot stack. Annually, the HEPAs are tested individually (per ASME N510), to a minimum efficiency of 99.95% for the removal of particulate matter with a median diameter of 0.3 μm.

THEREFORE, IT IS ORDERED that the project as described in said Notice of Construction and more specifically detailed in plans, specifications and other information submitted to the Washington State Department of Ecology in reference thereto, is approved for construction, installation and operation, provided the following conditions are met:

APPROVAL CONDITIONS:

1. TOTAL EMISSION LIMITS

A. The portable exhausters and other operations associated with dissolution and retrieval of waste from tanks 241-S-112, 241-S-102, and 241-U-107 will be permitted without additional control technology provided that the total emissions from all activities will not

result in exceedance of WAC 173-460 Small Quantity Emission Rates (SQERs) or of exceedance of maximum stack mass flow rates for N-Nitrosodimethylamine from 241-U-107 of 1.31 pounds per year, from 241-S-102 of 0.67 pounds per year, and from 241-S-112 of 0.9 pounds per year. Results of any monitoring and analysis will be maintained on file and made available upon inspection.

B. A new Notice of Construction will be required if total emissions of toxic air pollutants exceed the limits specified in Condition 1.A. above. The total emissions of N-Nitrosodimethylamine from all sources permitted herein must be less than the estimated limits in Condition 1.A. Results of any monitoring and analysis will be maintained on file at the tank farms and made available upon inspection.

C. A new NOC also is required if total emissions of criteria pollutants would exceed the WAC 173-400-110 thresholds.

2. GENERAL REQUIREMENTS

A. Notification will be made ten (10) days prior to initiating waste retrieval operations from each tank covered by this Order.

B. An updated schedule of installation and operation activities will be made available upon request.

C. Any or all of this approval order may be modified, upon Ecology concurrence or discretion, depending upon circumstances and findings during conduct of the operations herein described.

3. EMISSION CONTROLS

A. Emission controls for construction and operation of this project will be implemented by conditions 3.B., or 3.C., or a combination of 3.B. and 3.C. under the discretion of the permittee.

B. The portable exhausters may be used to control emissions. If the exhauster is in use, exhaust will be monitored for VOCs and ammonia until levels rise and fall off, or until the dome space VOC and ammonia concentrations are reduced to minimum levels (at which point the levels stop changing).

C. The controls established under the site-specific and general Health and Safety Plans, as they apply to minimizing the instantaneous mass emission rate from the tank, are hereby made part of this approval order. A list and description of these controls shall be provided to Ecology upon request.

4. EMISSION MONITORING

Although all contaminant emissions are estimated below their respective SQERs or below their ASILs, during waste retrieval, the following sampling and monitoring will take place to verify emissions estimates and to ensure emission limits are not exceeded:

A. Volatile Organic Compounds (VOCs), ammonia, and other air toxic levels, to include N-Nitrosodimethylamine as necessary, will be monitored in accordance with the industrial hygiene worker safety program and site-specific IH Monitoring Plan, approved sampling and analysis plan (SAP), and this order. A plan for monitoring shall be submitted to Ecology upon request.

B. Grab samples will be drawn and analyzed for nitrosamines (N-nitrosodimethylamine and related compounds) from the sampling port of the exhauster stack on each of the three tanks to be retrieved. Samples will be drawn within 15 minutes after the first start of an exhauster, approximately two hours after the first start of waste retrieval and again when approximately half of the waste has been transferred. This analysis is in addition to the list of compounds presented under item (C.) below. This sampling and analysis shall be functionally equivalent with standard EPA method 15A, including all Quality Assurance and Quality Control (QA/QC) protocols. The IH SAP (including a QA/QC plan) shall be provided to Ecology. Additional samples and analyses may be conducted but overall sampling must be sufficient to demonstrate compliance with emission limits of Condition 1, above, with consideration of practical quantitation limits.

C. Additional SUMMA sampling will be performed in accordance with the IH SAP to obtain a representative sample of standard target compounds. However, any spikes detected during analysis that are not on the target compound list will be noted and analyzed if warranted. This sampling and analysis shall be functionally equivalent with standard EPA method 15A, including all Quality Assurance and Quality Control (QA/QC) protocols.

D. If the exhauster is not operated at all during the retrieval operation, alternative sampling and analysis methods to determine maximum emissions will be established under the IH Monitoring Plan. A SAP (including a QA/QC plan) shall be provided to Ecology upon request. The permitee will provide an alternative plan for measuring toxic emissions if the exhauster is not operated during retrieval. Ecology reserves the right to request a modification to this plan.

5. MANUALS

Operation and Maintenance (O&M) Manuals for all equipment associated with the proposed activities that have the potential to affect emissions to the atmosphere shall be developed and followed. Manufacturers' instructions may be referenced. The O&M manuals shall be updated to reflect any modifications of the process or operating procedures. Emissions that result from failure to follow the requirements of the O&M Manuals or manufacturer's instructions and recommendations may be considered proof that the equipment was not properly or adequately installed, operated, maintained, and tested. Copies of the O&M Manuals shall be available to Ecology upon request.

6. INITIAL NOTIFICATIONS & SUBMITTALS

All notifications and submittals required under these Approval Conditions shall be sent to:

Washington State Department of Ecology
Nuclear Waste Program
3100 Port of Benton Boulevard
Richland, Washington 99352

7. MONITORING and RECORDKEEPING

Specific records shall be kept by the Permittee and made available for inspection by Ecology upon request. The records shall be organized in a readily accessible manner and cover a minimum of the most recent sixty (60) month period. The records to be kept shall include the following:

A. Work Package activities related to site occupational health sampling/monitoring and control.

B. Evaluations of additions or changes to demonstrate compliance with the SQER limits (for additions or changes not otherwise exempt under WAC 173-400 or -460).

C. All monitoring and operations records required to operate the emission control equipment, and to implement T-BACT, as described in section 3.

8. ASIL EVALUATION

The methodology used in evaluating emissions, to demonstrate potential total emissions are below the ASILs as described in Section 7.0 of the NOC application, may be modified with Ecology's concurrence.

9. GENERAL CONDITIONS

A. **Visible Emissions:** No visible emissions shall be allowed beyond the property line.

B. **Commencing/Discontinuing Construction and/or Operations:** This approval shall become void if the proposed activities are not commenced within eighteen (18) months after receipt of this Order approving the NOC application, or if activities are discontinued for a period of eighteen (18) months.

C. **Compliance Assurance Access:** Access to the source by EPA or Ecology shall be allowed for the purposes of compliance assurance inspections. Failure to allow access is grounds for revocation of the Order approving the NOC.

D. **Modification to Facility or Operating Procedures:** Any modification to any equipment or operating procedures, contrary to information in the NOC application, shall be reported to Ecology at least sixty (60) days before such modification. Such modification may require a new, or amended, NOC Approval Order.

E. **Activities Inconsistent with this Order:** Any activity undertaken by the Permittee or others, in a manner that is inconsistent with the NOC application, and this determination, shall be subject to Ecology enforcement under applicable regulations.

F. **Obligations under Other Laws or Regulations:** Nothing in this Order shall be construed to relieve the Permittee of its obligations under any local, state, or federal laws, or regulations.

Nothing in this approval shall be construed as obviating compliance with any requirements of law, other than those imposed pursuant to the Washington Clean Air Act, and rules and regulations thereunder.

Nothing in this approval shall impose any requirement for retroactive action with regard to operational, sampling and monitoring, or analytical activities.

A two (2) month testing and break-in period is allowed, after any part or portion of this project becomes operational, to make any changes or adjustments required to comply with applicable rules and regulations pertaining to air quality and conditions of operation imposed herein. Thereafter, any violation of such rules and regulations, or of the terms of this approval, shall be subject to the sanctions provided in Chapter 70.94 RCW.

Authorization may be modified, suspended or revoked (in whole or part) for cause, including, but not limited to, the following:

- Violation of any terms or conditions of this authorization,
- Obtaining this authorization by misrepresentation, or failure to disclose fully all relevant facts.

The provisions of this authorization are severable and, if any provision of this authorization, or application of any provisions of this authorization, to any circumstance, is held invalid, the application of such provision to their circumstances, and the remainder of this authorization, shall not be affected thereby.

Any person aggrieved by this ORDER may obtain review thereof by application, within thirty (30) days of receipt of this ORDER, to:

Pollution Control Hearings Board
P.O. Box 40903
Olympia. Washington 98504-0903

Concurrently, copies of the application must be sent to:

Washington State Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600

Washington State Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99352

These procedures are consistent with the provisions of Chapter 43.21B RCW, and the rules and regulations adopted there under.

DATED at Richland, Washington, this 3rd day of November 2004.

PREPARED AND REVIEWED BY:

Doug Hendrickson, P.E.

APPROVED BY:

Michael A. Wilson EK Hammond for